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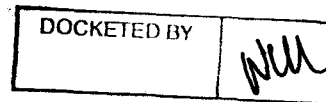
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September 1, 2006

Mr. Jerry Smith
Arizona Corporation Commission
1200 W Washington Street
Phoenix AZ 85007

Arizona Corporation Commission
DOCKETED
SEP 01 2006

Mr. Jeff Palermo
KEMA Inc.
4400 Fair Lakes Court
Fairfax, VA 22033



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RECEIVED

Re: Comments on Draft for ACC Fourth Biennial Transmission Assessment
Docket No. E-00000D-05-0040

Dear Sirs:

Enclosed are Arizona Public Service Company's ("APS") comments on the draft for the ACC's 4th BTA Report. Due to the voluminous nature of the report APS has only attached redlined pages with suggested edits.

Arizona Public Service Company ("APS" or "Company") appreciates the efforts by Arizona Corporation Commission ("Commission") Staff and KEMA in the development of the fourth Biennial Transmission Assessment ("BTA") and the opportunity provided to the stakeholders comment on this draft report. If you have any question, please feel free to contact me at 602-250-1144.

Sincerely,

Robert Smith 19aw

Robert Smith
Manager Transmission Planning and Engineering

cc: Docket Control (Original, plus 15 copies)

APS Comments on the Draft of the 4th BTA report

Arizona Public Service Company ("APS" or "Company") appreciates the efforts by Arizona Corporation Commission ("Commission") Staff and KEMA in the development of the fourth Biennial Transmission Assessment ("BTA") and the opportunity provided to the stakeholders to comment on this draft report. APS' comments are set forth in three parts. First, APS provides general comments about the report and/or process. Second, APS provides more specific comments on various sections of the draft. Third, APS is providing a marked-up/redline version of the draft report.

General Comments:

- Since there are many places where information is missing or needs further explanation, APS believes that it would be beneficial for another draft to be published for review before the final report is issued.
- There are many sections containing historical information (e.g., about the first three BTAs) that could lead to confusion for the reader. Deleting some of the historical or extraneous information might be beneficial to the reader.
- A number of significant conclusions embedded within the report are not captured or are represented differently in the Conclusions, Section 9, at the end of the report. We have redlined suggested additions to Section 9.
- An Executive Summary and a copy of the Conclusions are needed at the beginning of the document.
- Several charts, tables and figures contain incorrect and/or duplicated information. It would be difficult, and in most cases impossible for APS to redline these charts, tables and figures. APS is willing to work with KEMA personnel to identify and correct these.

Specific Comments:

- The EPACT and FERC Orders might be better placed as appendices to the report.
- **Section 4.1 System description:** This section compares the total MWhs of retail sales in Arizona for 2005 to the MWhs Arizona plants generated in 2005. Based on that comparison, a conclusion is drawn that "installed generation has more than kept pace with the growth in retail sales." APS believes that the use of MWhs is not the proper tool for an evaluation of this kind. A comparison of generation capacity to peak load would be a better measure.

- **Section 4.3.2 Palo Verde Risk Assessment:** APS performed a Palo Verde Hub Risk Assessment study as part of the PV Hub-TS5 500kV project. Due to the sensitive nature of the material, this report is being provided to Staff under a confidentiality agreement. APS believes this study should be noted in the fourth BTA.

The end of this section suggests that state regulations should be developed regarding interconnection requirements. Because transmission interconnection is a Federal Energy Regulatory Commission ("FERC") jurisdictional issue, Staff would need to work with FERC to amend the current FERC regulations. For example, instituting regulations requiring Exempt Wholesale Generators ("EWGs") to provide interconnection service and possibly transmission service could result in unintended consequences. The generator could be required to establish an OATT and lose its EWG status. Although the concept may be appropriate, it should be developed through the FERC processes and needs to be consistent with FERC policies.

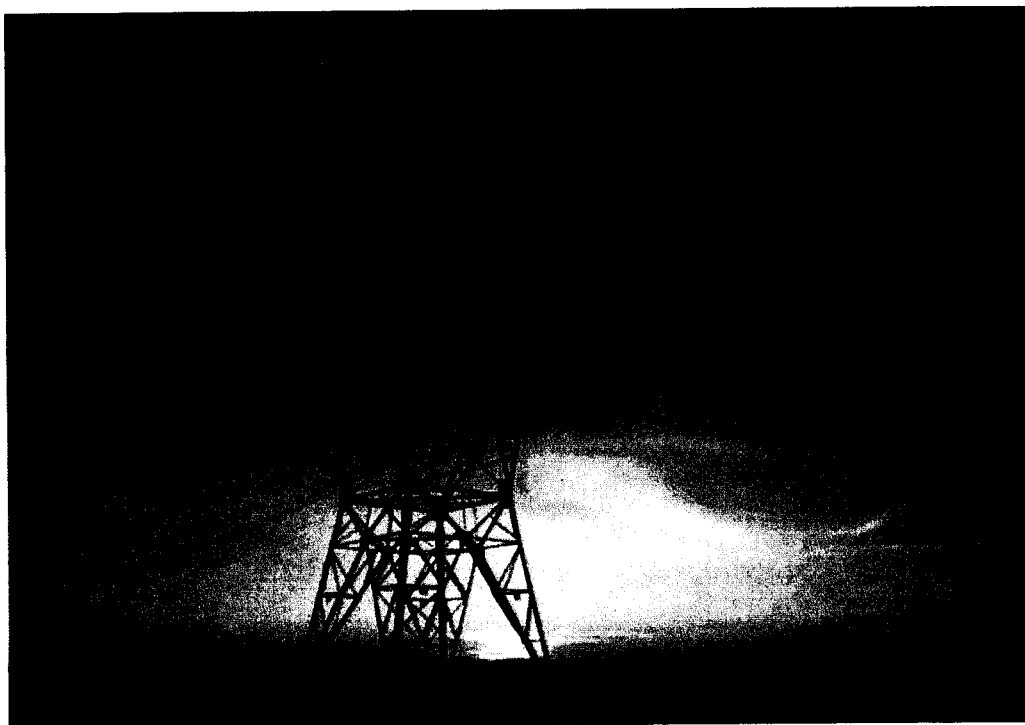
In regards to very last paragraph, about only allowing generators to interconnect as a network resource, if that is implemented, transmission providers could be caught in a regulatory Catch-22. A generator could ask for Energy Resource Interconnection Service instead of Network Resource Interconnection Service and, if the utility denies the request based upon state requirements, the utility could be in violation of its OATT and FERC requirements. For these reasons, APS encourages Staff to work with the FERC to ensure that state and federal requirements are consistent.

- **Section 5.1 Metropolitan Phoenix Area:** It is stated that the 500kV transmission additions and major 230kV additions are mostly in the northern and eastern sides of the metropolitan area. APS believes that there are significant additions, both 500kV and 230kV, being made in the western side of the metropolitan area as well.
- **Section 5.7 Navajo Transmission Project:** The project description appears to be out-dated. Staff and KEMA should consider requesting updated information from the Dine Power Authority.
- **Section 6.2.2.1 Yuma existing and future transmission system:** In this section a 230kV line from Gila Bend to Yuma is listed as an addition to the 2008 system. This planned line was not used for the 2008 analysis and was replaced in APS' plans with the Palo Verde Hub-North Gila 500kV #2 line scheduled in 2012.
- **Section 6.2.2.2 Yuma area – SIL and RMR conditions for 2008 and 2015:** This section states that for 2015, the critical outage is loss of the new TS8-Gila Bend 230kV line and the limiting element is the Pilot Knob-Yucca 161kV line. Although this is consistent with the 2006 RMR study report, that report was incorrect. Instead, the limiting outage is loss of the Cocopah-Riverside 69kV line and the limiting element is the Riverside-10th Street 69kV line. This was only a miss labeling of the limiting outage and limiting element within the write-up of the report and the results and conclusions would not be effected.

Also, the last two paragraphs of this section contain the results of the 2004 RMR study and not the 2006 RMR study. This section should be updated to reflect the more current information.

- **Section 6.2.5 Overall Staff Observations and Recommendations on RMR:** The end of the first paragraph states: "However, this does not take into account costs associated with the new generation solicitation that APS is conducting for the Yuma area. These economics should be presented to the Commission when they are available." The new generation at Yucca was included in the RMR analysis. Any further justification of the new generation can be addressed in our pending ACC application regarding new Yuma resources and need not be a part of the BTA
- **Section 7.1 2003 and 2004 generation interconnection requests:** APS recommends that this section be updated to reflect 2005 and 2006 generation interconnection requests.

Arizona Corporation Commission Fourth Biennial Transmission Assessment – 2006-2015



Arizona Corporation Commission Fourth Biennial Transmission Assessment
for 2006-2015,
Docket No. E-00000D-05-0040

Arizona Corporation Commission Utilities Division

KEMA, Inc.

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Arizona Corporation Commission

Docket No. E-00000D-05-0040

Decision No. _____

FIRST DRAFT

Fourth Biennial Transmission Assessment

2006-2015

September 1, 2006

Prepared by Arizona Corporation Commission Staff

and

KEMA Inc.

4400 Fair Lakes Court

Fairfax, VA 22033

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- Arizona utilities collaborate with the Staff to develop and effectively implement more stringent criteria as appropriate for RMR areas in the 2006 BTA.
- b. All future interconnections proposed at the Palo Verde Hub, either new generation or new transmission line, must perform a risk assessment of the Hub to ascertain to what degree the proposed project mitigates the pre-existing risks to extreme outage events. This assessment must precede a project's application for a CEC with the Commission. The recommendations of the Palo Verde Risk Assessment report should be followed if a proposed project would otherwise exacerbate the existing risk at the Hub.
- c. The Fourth BTA address and document:
 - Compliance with single contingency criteria overlapped with the bulk power system facilities maintenance (N-1-1) (for the first year of the BTA analysis) as required by WECC and NERC.
 - Extreme contingency outages studied for Arizona's major generation hubs and major transmission stations including identification of associated risks and consequences if mitigating infrastructure improvements are not planned.

1.3 Fourth Biennial Assessment – Purpose and Framework

1.3.1 Purpose

Staff undertook the Fourth BTA, which evaluates the utilities' 2006-2015 transmission plans filed in January 2006, under Docket No. E-00000D-05-0040. This report fulfills the Staff's statutory obligation to review these transmission plans and assess whether the Arizona transmission system is adequate. The 2006 RMR study, the 2005 and 2006 ten-year plans, and the extreme contingency analysis are the subject of this assessment. Of particular interest are the adjustments made by the industry to address the concerns identified in the Staff's First, Second and Third BTAs. Staff hired a consulting organization, KEMA Inc. ("KEMA") to assist Staff in this effort.

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The adequacy of an existing or planned electric system is determined by technical simulation studies. Such studies require the use of: databases, software and transmission planning reliability standards, and planning assumptions. The process assumes that the Arizona transmission utilities conduct their own studies, participate in the collaborative regional planning process, and present the study results in the ten-year plan reports and at public workshops. Staff and KEMA reviewed and analyzed all these study reports assembled by Staff, and organized two workshops. Staff relied on the technical reports and documents filed with



the Commission by the various organizations, rather than performing technical studies of their own.

Staff used a set of guiding principles to aid it in determining the adequacy and reliability of both transmission and generation systems.¹ Staff's guiding principles are based upon best engineering practices established in Arizona coupled with the use of WECC and NERC planning standards.^{2,3} Staff and KEMA critically reviewed and analyzed the transmission planning documents assembled by Staff and addressed the following questions:

- Do the proposed Arizona transmission system plans meet the load serving requirements of the state during the 2006-2015 period, in a reliable manner?
- Was the transmission planning process conducted in accordance with the transmission planning principles and good utility practice accepted by the power industry?
- What steps were taken in the new transmission planning studies to effectively address Staff concerns raised in the First and Second BTA about the adequacy of the state's transmission system to reliably support the competitive wholesale market emerging in Arizona?
- Do the transmission plans adequately reflect NERC's latest activities related to compliance with the transmission planning standards, as well as compliance with WECC reliability standards?

1.3.2 Framework

Staff and KEMA made use of a three-stage process to facilitate the electric industry's participation in the third BTA:

1. Workshop I: industry presentation;
2. Preparation of Initial Draft Report and industry comments on draft; and
3. Workshop II: Staff/KEMA presentation and Final Report.

An overview of each stage is described below.

¹ Guiding Principles for ACC Staff Determination of Electric System Adequacy and Reliability: Appendix A

Arizona's Best Engineering Practices, Jerry D. Smith, ACC, pre-filed comments for the Gila Bend Power Plant Hearing, Docket No. E-00000V-00-0106, November 9, 2000

² <http://www.wecc.biz/modules.php?op=modload&name=Downloads&file=index&req=viewsdownload&sid=101>

³ http://www.nerc.com/~filez/standards/Reliability_Standards.html



1.3.2.1 Workshop I: industry presentation

Staff and KEMA organized and facilitated a one-day public Workshop on June 6, 2006. Transmission Providers and Regional Planning Groups presented information regarding their transmission expansion plans and related activities to supply native load customers for the next ten-years. In addition, merchant transmission and wind generator developers reported on their development plans.¹ The Workshop provided an informal setting to promote effective discussions of the presentations from transmission providers and merchant plant developers. The Workshop I participants are listed in Appendix B.

The workshop was organized in six presentations:

1. Southwest Area Transmission Planning (SWAT), ~~Central Arizona Transmission System (CATS)~~, Extra-high voltage (EHV)—Gary Romero;
2. Arizona Public Service—Bob Smith;
3. Diné Power Authority;
4. Salt River Project—Chuck Russell;
5. SWTC—Bruce Evans; and
6. Tucson Electric Power—Ed Beck.

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An open period of discussion and audience questions followed each presentation.

Staff's opinion is that the Transmission Providers presented enough information to allow a suitable assessment of the status of Arizona's transmission system reliability.

1.3.2.2 Preparation of initial draft report and industry comment on draft

Staff and KEMA provided the first draft of the ~~2006 BTA report for industry review and comment~~. The first draft of the report was based on the utilities' filed plans and the participants' responses to questions raised at Workshop I.² The draft report and industry comments were placed on the Commission website to expedite the review process.

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1.3.2.3 Workshop II: Staff/KEMA presentation and final report

Workshop II, organized on September 24, 2004, presented the Staff's response to industry comments on the first draft of the 2004 BTA Report and allowed for discussion and questions.³

¹ The Workshop presentation materials are located on the ACC website.

² Transcripts of June 30, 2004 Workshop I

³ The Workshop presentation materials are located on the ACC website.



WECC's Reliability Management System ("RMS") agreement establishes a process to manage compliance with the established criteria. This process includes compliance monitoring, annual study reports, a project review and rating process, and an operating transfer capability policy group process. Compliance is ensured with regard to control performance, operating reserve and operating transfer capability, and disturbance control. While WECC members self-declare their compliance, WECC conducts compliance reviews through random audits. The RMS includes system operator requirements for managing transactions within major transmission path operating limits. WECC also addresses the unscheduled flow mitigation scheme approved by FERC.

For reliable operation of the western interconnection, WECC requires all entities to comply with their Minimum Operating Reliability Criteria ("MORC")¹. MORC is applicable to system operation under all conditions even when facilities required for secure and reliable operation have been delayed or forced out of service. MORC principles applicable to the transmission system operation are:

- The interconnected power system shall be operated at all times so that system instability, uncontrolled separation, cascading outages, or voltage collapse will not occur as a result of single or multiple contingencies of sufficiently high likelihood.
- Continuity of service to load is the primary objective of the MORC. Preservation of interconnections during disturbances is a secondary objective except when preservation of interconnections will minimize the magnitude of load interruption.

Since electric system reliability is so vital to Arizona, Staff contends that it is appropriate to apply the most specific and stringent criteria. Thus the Staff supports WECC's MORC.

3.1.2.1 Transmission paths in the wecc

A grouping or set of transmission lines connecting two areas is often referred to as a transmission Path. Transmission paths consist of one or more lines emanating from a common location or between two regions. The performance of each transmission line within a transmission path is interdependent upon the performance of other lines in the same path.

Adequacy, (Revised 2/23/04)

ftp://www.nerc.com/pub/sys/all_updl/pc/rtatf/RTATF_ReportBOTapprvd_061504.pdf

¹ <http://www.wecc.biz/sdpp.html>

**Table 3: WECC paths in Arizona**

WECC path	WECC path name
22	Southwest of Four Corners Four Corners – Moenkopi Four Corners – Cholla #1 Four Corners – Cholla #2
23	Four Corners 345/500 kV Qualified Path
45	SDG&E – CFE
46	West of Colorado River (WOR)
47	New Mexico - Greenlee
49	East of Colorado River
50	Cholla - Pinnacle Peak
51	Southern Navajo

3.1.3 Arizona utilities transmission planning standards

The utilities in Arizona plan their system facilities by following NERC and WECC reliability standards. In addition, each utility in the State develops its own internal reliability criteria and planning processes to assist in planning its EHV-345kV and above, HV transmission system, and local areas. Each utility plans the transmission system to operate with no thermal overloads on lines and equipment, and voltages within defined limits under normal and emergency conditions. The Arizona transmission system is planned based on NERC and WECC single contingency criteria.¹ These criteria require that there should be no loss of load on the system for a single element contingency. There are credible disturbances, which are not probable, for which it is not economically feasible to protect against. These criteria recognize the need for direct load tripping for more severe disturbances, but the load tripping should be controlled to limit the adverse impact of the disturbance. Uncontrolled load shedding is unacceptable even under the most adverse, credible disturbance.

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The Arizona utilities have provided detailed information regarding the assumptions, studies performed and criteria used in their 10-year plans. The studies include power-flow, stability, and short-circuit analyses. While it is not explicitly stated, it appears that the plans are developed to only meet NERC category A and B criteria—normal and single contingency conditions. No evaluations appear to be made of NERC category C or D criteria—multiple and extreme contingencies. As is discussed later in chapter 6 of this report, the utilities perform companion studies of transmission and generation requirements for local load pockets. In some cases, these studies include evaluations of NERC category C & D contingencies.

¹ Workshop I Transcript, Page 165, Lines 9-17



Status	Project	Justification	CEC needed
2008 completion			
2007 construction start	Interconnection of Westwing - South 345 kV with future Hassyampa - Pinal West 500 kV line via new Pinal West 500/345 kV Substation	To reinforce Tucson Electric Power Company's EHV system and to provide a higher capacity link for the flow of power from the Palo Verde area into TEP's service territory.	Siting Case #124
2009 completion			
2008 construction start	Flagstaff 345/69kV Interconnection	This project will serve projected need for electric energy in APS' northern service area. The project will improve reliability and continuity of service for the growing communities in northern Arizona.	A Certificate of Environmental Compatibility is not needed for this project.
2009 construction start	Palo Verde-TS5 500kV line	This line will serve projected need for electric energy in the area immediately north and west of the Phoenix Metropolitan area. It will increase the import capability to the Phoenix Metropolitan area as well as increase the export capability from the Palo Verde hub. This is a joint participation project with APS as the project manager.	Certificate of Environmental Compatibility issued 8/17/05 (Case No. 128, Decision No. 68063, Palo Verde Hub to TS5 500kV Transmission project). APS, as project manager, holds the CEC.
2009 construction start	Second Knoll loop-in of Coronado-Cholla 500kV line	This project will be needed to serve projected need for electric energy in Show Low and the surrounding communities.	A Certificate of Environmental Compatibility is not needed for this project.
2009 construction start	WV1 loop-in of Navajo-Westwing 500kV line	This project will serve projected electrical needs and provide support to the existing subtransmission system in the Verde Valley and Prescott areas.	A Certificate of Environmental Compatibility is not needed for this project.
2009 construction start	Devers-Palo Verde No. 2 500 kV Line	This 500 kV line will increase transfer capability between Arizona and Southern California.	No information filed
2009 construction start	Palo Verde - Pinal West 500 kV (Reference SRP Ten-Year Plan 2006 filing)	To provide access to resources from the Palo Verde area generation to the future (beyond this Ten-Year Plan) 500/69 kV station located at the Pinal West substation.	CEC Ordered in Case 124, Issued May 24, 2004
2009 construction start	Pinal West - Santa Rosa 500 kV (Reference SRP Ten-Year Plan 2006 filing)	To provide access to resources from the Palo Verde area generation to the Santa Rosa 500 / 230 kV Substation	CEC Ordered in Case 126, Issued August 25, 2005

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In its 2004 RMR Study, APS reported that the load flow and voltage stability analyses were done in order to determine Phoenix area critical outages as required by transmission planning criteria. APS conducts their analyses assuming that enough operating reserve will be available within the Phoenix area to respond during single contingencies.¹ By maintaining an operating reserve within the load pocket, APS performs contingency analysis under more critical conditions than just (N-1) category. These criteria require transmission planning to accommodate maintenance outages while still being able to meet the N-1 criteria during a subsequent forced outage. The nature of the Phoenix area load is such that during the eight month period of October-May, any line or local area generator can be taken out of service for maintenance with adequate import capability and local area generation remaining to meet the N-1 criteria. Maintenance outages of 12-14 hours can also be taken during the summer at night. This capability will be documented in future 10-year plan filings.

The voltage stability study was performed using Q-V analysis on the most reactive deficient buses in the Phoenix area. These buses were the Kyrene 500-kV, Kyrene 230-kV, Browning 230-kV, Westwing 230 kV, and the Pinnacle Peak 230-kV buses. A Q-V analysis is performed by adding reactive load at the critical bus until the voltage reaches a minimum value, which indicates potential voltage instability. The voltage stability import limit is determined as the lesser of 95% of the import with zero reactive margin, or 100% of the import with a 5% voltage drop following the worst single-contingency per WECC planning criteria.

At present the Phoenix area is served from the following major EHV substations: Westwing, Pinnacle Peak, Kyrene, Rudd, Browning, and Silverking. These EHV stations form the "cornerstones" of an extensive internal network of 230-kV transmission lines that constitute the high voltage system within the Phoenix load area. By summer 2009, the new TS5 EHV substation will be added in the northwestern Phoenix area. The 4th BTA filings anticipate that two more EHV substations will be added to help supply load growth in the Phoenix area by 2015, the South East Valley (SEV) substation and the Raceway substation on the north side of Phoenix. Figure 23 illustrates some of these existing EHV substations and planned additions.

¹APS 2004 RMR Study, Page 8



- The second is WAPA's Gila 161/69 kV station, which is also located east of Yuma.
- The third is APS' Yucca 161/69 kV station, which is located on the west side of Yuma near the Colorado River. APS' local generation is located at this station, along with an interconnection to Imperial Irrigation District's (IID), 161 kV system through two 161/69 kV transformers. The IID 75 MW steam-generating unit is also located at this substation.

In its 2006 RMR Study, APS reported that load flow and voltage stability analysis were done to determine Yuma-area critical outages as required by transmission planning criteria. APS conducts contingency analysis based on single contingency (N-1) criteria.

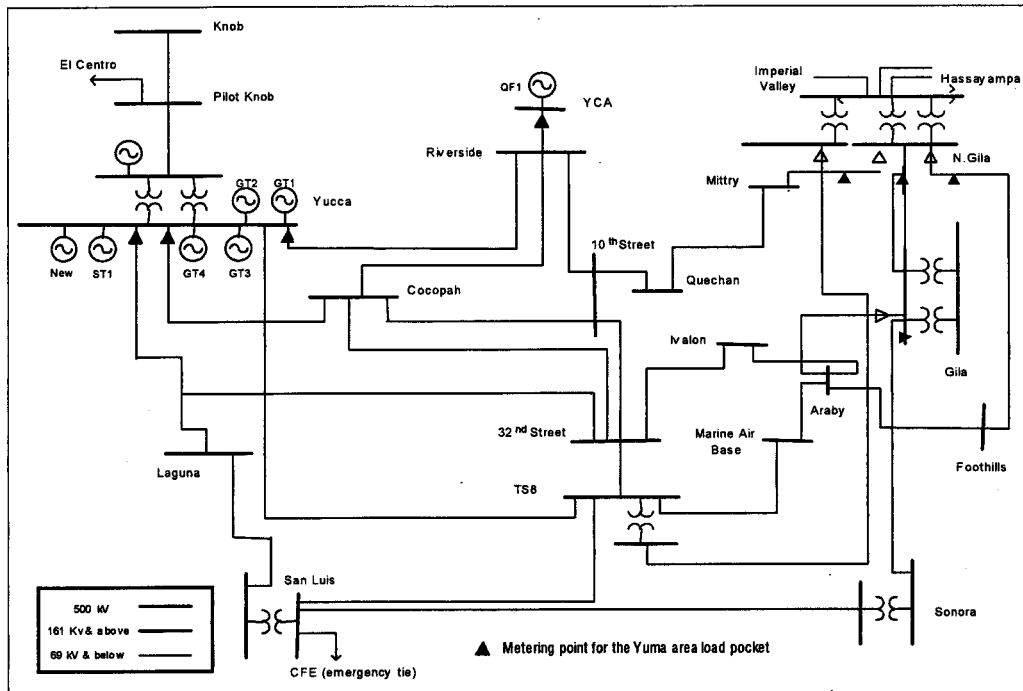
Recent and planned additions in the Yuma area included in the 2008 RMR analysis were as follows:

- A second North Gila 500/69-kV transformer was installed in 2005 as a result of the 2003 RMR study.
- The Welton-Mohawk interconnection facilities and generators, which are planned for 2006, were modeled in the 2008 case. The interconnection facilities will consist of a 161-kV line and a third 161/69-kV transformer to WAPA's Gila substation, along with a 161-kV line and 161/69-kV to APS' North Gila 69-kV substation.
- 100 MW of new APS owned generation at Yucca Substation.

The planned 2008 Yuma area system and interconnections are shown in Figure 26:

Deleted: <#>The addition of the 230-kV line from Gila Bend to the Yuma area in 2012. The specific Yuma termination for this line has not yet been determined and for the 2012 analysis. APS assumed it was interconnected to the 32nd Street substation. Figure 26 illustrates these additions. ¶

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**Figure 27: APS Yuma area in 2015**

6.2.2.2 Yuma area – SIL and RMR conditions for 2008 and 2015

With planned system additions for the Yuma area, along with some accelerated projects the SIL and MLSC for the Yuma area will increase enough to serve the rapidly growing load and maintain the desired generation reserves.

It should be noted that due to the calculation method used by APS, the MLSC does not equal the direct summation of SIL and Local Generation. APS determines the MLSC graphically by determining an operating nomogram for each year. The maximum amount of load that can be served is then determined from the highest point on the nomogram, which does not necessarily occur at the point of maximum local generation. [@ APS TO PROVIDE WRITEUP]

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Several critical contingencies exist affecting the determination of the system import limit for the Yuma area in the 2008 through 2015 timeframe. For the 2008 period, the critical event is loss of the Hassayampa-N. Gila 500 kV line and the limiting element is the Pilot Knob-Yucca



161 kV line. In 2015, the critical outage is loss of the Cocopah-Riverside 69-kV line and the limiting element is the Riverside-10th Street 69-kV line.

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To determine the RMR costs for the Yuma area, an economic analysis was performed using a regional production-cost model, just as for Phoenix. The comments Staff provided in Section 6.2.1.2 are applicable to Yuma RMR cost calculation.

~~The analysis indicated that the Yuma import limit would be constraining for 336 hours in 2008, 22 hours in 2015, and 220 hours in 2015. The energy associated with these hours amounts to 2,200 MWh. The cost of this constraint in 2008 is approximately \$500,000. APS found that it would be more economical to import than export power from APS limits outside the Yuma area from the wholesale market.~~

~~The Yuma RMR cost analysis as well as the Yuma area Air Pollution Regulations analysis shows that advancement of the transmission projects are not feasible. Consequently, there are no alternatives proposed for reinforcement of the Yuma area transmission system in order to increase the transmission import limit other than projects already planned.~~

Comment [51]: This is information from the 2004 RMR study. This section needs to be updated with the 2006 results.

6.2.2.3 Yuma 2008 and 2015 RMR Study Findings

The Yuma area 2006 RMR study findings are as follows:

- All existing and planned Yuma area generation and transmission projects are needed to reliably serve the area.
- APS load is expected to exceed imports in 2008 by 1,703 hours. As a result of the second Palo Verde to North Gila 500kV line and other upgrades, this figure drops to 553 hours in 2015.
- Estimated annual cost to run local generation "out of the money" is approximately \$1.3 million in 2008, but due to the expansion plans from 2008 to 2015 these costs will be negligible in 2015.
- Removing the remaining transmission constraints would have a negligible impact on Yuma area air emissions in the 10 year plan period.

6.2.2.4 Staff Observation

In this section, Staff provides its observations of the SIL and RMR components for the Yuma area. Addition of the second North Gila 500/69kV transformer in 2005, the planned Yucca 100 MW generation addition and the proposed 500kV Palo Verde-North Gila line appear to effectively manage RMR conditions in Yuma area. With the planned additions, the future Yuma

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¹ APS 2004 RMR Study, Table 17, Page 49.



6.2.5 Overall Staff Observations and Recommendations on RMR

ACC Staff raised a concern during the 3rd BTA regarding the available resource margin in the greater Phoenix load area for the 2012 timeframe. Based on revised expansion plans identified in filings by APS and SRP in the 4th BTA, Staff concludes that the resource margin in the Phoenix area should be adequate throughout the 2006-2015 timeframe. As a result of its 2006 RMR study for the Yuma area, APS has initiated a solicitation for 100 MW of new generation to be installed at the Yucca plant site by 2008. Based on the results of the 2006 Phoenix area and Yuma area RMR analyses, ACC Staff concludes that these RMR costs will have a negligible impact on rates in the 2006-2015 timeframe. However, this does not take into account costs associated with the new generation solicitation that APS is conducting for the Yuma area. These economics should be presented to the Commission when they are available.

TEP projects an RMR requirement in the Tucson area of 160 MW in 2008 growing to 300 MW in 2015. They estimate the costs to dispatch these units will increase from \$1.37 million in 2008 to \$3.11 million in 2015. However, TEP clarified subsequent to its filing that a significant portion of this generation is expected to run based on merit order dispatch regardless of local reliability requirements. Therefore, Staff concludes that the preceding figures overstate the cost impact of the Tucson area import constraint. [Ed Beck advised Dave Korinek on 8-1-06 that he would provide a corrected RMR cost estimate.]

Although no RMR analysis was filed in the 4th BTA for Mohave County, participants are of the opinion that the Western Area Power Administration transmission system supplying Mohave County should be sufficient to meet the area's requirements. However, Staff concludes that the adequacy of the Mohave supply system beyond 2012 is uncertain due to contractual constraints and this issue should be addressed in detail in the 2008 BTA. The 2008 study should also determine if the proposed UES Griffith-North Havasu 230/69kV line will impact Mohave County import capability.

In the 2008 BTA, Arizona utilities should clarify how they intend to define future RMR boundaries given projected load growth and facility expansion in the greater Phoenix area as well as Pinal County to the south.

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ACC Staff observes that parties in the 4th BTA have referred to SIL in terms of both technical and contractual limits. The correlation between these two dimensions of SIL is unclear. For the next round of RMR studies due in January 2008 the parties should include a comparison of the technical SIL value against projected transmission ownership/scheduling rights into each constrained load area in Arizona during the 2008-2009 period.

ACC Staff also observes that the calculation of MLSC and reserve margin values in the 2006 RMR studies is not transparent. In the 2008 RMR study, the parties should agree on a consistent and



Staff concludes that these cases adequately address the key extreme contingencies of interest, but TEP should continue its review of the specific items as noted in the table(s) above and inform the Staff of their conclusions. It should be noted that the TEP N-2 line outages included in Table 15 are also extreme contingency events.

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9. Conclusions

Staff offers the following conclusions for Commission consideration:

1. The electric industry in Arizona has been very responsive to concerns raised in Staff's Third BTA. It seems clear that the hard work of the transmission providers and the other stakeholders during the last two BTAs has resulted in an improved work product and a more collaborative study process. This collaborative process has continued in 2006 as evidenced by the joint APS/SRP RMR study of the Phoenix load area.
2. Since the 2002 BTA, with the encouragement of the ACC and its staff, the planning process has become much more collaborative and regional. In this collaborative environment, extensive regional studies addressing the interstate and intrastate transmission needs have been conducted. The proposed Palo Verde/Hassayampa-North Gila 500kV line offers a good example of the collaboration that can be achieved between transmission providers in Arizona. Achieving such synergies increases the value of transmission projects to Arizona. As evidence of this, the jointly sponsored projects in this 10-year plan are shown in Table 17.

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Table 17: Jointly sponsored projects in this 10 year plan

Project	Voltage (kV)	Year In-Service (Est.)	Participants
Palo Verde-TS5 line	500	2009	APS, SRP, & CAWCD
TS5-Raceway	500	2012	APS, SRP, & CAWCD
Loop-in Navajo-Westwing at Raceway	500	2010	APS, SRP, & CAWCD
Raceway-Pinnacle Peak	500	2010	APS, SRP
Hassayampa-Pinal West	500	2008	SRP, TEP, SWTC, Santa Cruz Water & Power Dist.
Pinal West-Southwest Valley/Browning	500/230	2007-2011	SRP, TEP, SWTC, Santa Cruz Water & Power Dist.
Desert Basin-Pinal South/Santa Rosa	230	2011	SRP, et al

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Palo Verde-North Gila #2	500	2012	APS, SRP, IID, & WELTON MOHAWK
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3. While there have been laudable activities by the various stakeholders to encourage and participate in regional coordinated transmission planning, not all transmission needs are regional. Numerous new transmission and generation projects have been constructed, announced, and filed with the Commission since the prior BTAs. Some transmission projects filed in prior BTAs have been cancelled, delayed or advanced based on changes in load, generation and import conditions. Staff finds these changes acceptable.
4. Transmission providers have performed updated reliability-must-run studies for each local transmission import constrained area (except Santa Cruz County and Mohave County) and have addressed the Third BTA RMR requirements. Uncertainty exists regarding RMR requirements in Santa Cruz County beginning 2008 and Mohave County beginning 2012, which should be addressed in filings for the 5th BTA by January 2008.
5. In general, the existing and proposed Arizona transmission system meets the load serving requirements of the state in a reliable manner:
- a. Many planned Extra High Voltage ("EHV") and High Voltage ("HV") projects will increase transmission system capability to support increased interstate power transfers, and to provide reliable transfers within the state of Arizona.
 - b. The EHV system appears to be adequate throughout the study period and the planned facilities identified in the ten-year planning process are consistent with good utility practice. As is often the case, plans for the later years of the period are less well defined than those in the early years. As requested in the Third BTA, this new round of reports includes more discussion of alternate additions considered for the final five years of the study period. Given the number of alternative projects identified in the longer range plans it should be possible to meet future needs for supplying Arizona's electric system loads in an economical and reliable fashion. Also, performing the CATS-HV interim study was a proactive approach to planning. These practices allow the Staff and public to be better informed regarding future possibilities and should continue in future filings.
 - c. The RMR studies show that the RMR areas will have load-serving capacity sufficient to provide reliable supply during the next ten-year

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period (with the exceptions noted in Conclusion 3.) Problems are identified during the Third BTA in the Yuma area in 2004 and the Phoenix area in 2013 are addressed and resolved in the 2006 RMR study. The reserves in the Phoenix area are projected to be greater than the 99% reliability reserve requirement of 865 MW.

- d. The RMR studies have not justified a need for additional transmission projects as an alternative to dispatch of local area generation. For the Phoenix and Yuma areas, based upon the study results reported for the two years examined (2008 and 2015), the ACC Staff concludes that the RMR costs and emission impacts should be negligible throughout the 2006-222015 period. For the Phoenix metropolitan area, ACC Staff concludes that the SIL and MLSC increases are attributable to the planned transmission improvements described in the 2006 BTA filings by APS and SRP. Addition of the second North Gila 500/69kV transformer in 2005, the planned Yucca 100 MW generation addition and the proposed 500kV Palo Verde-North Gila line appear to effectively manage RMR conditions in the Yuma area.
- e. The planned Arizona transmission system meets the WECC and NERC single contingency criteria (N-1). Performance of the system has also been demonstrated during the Fourth BTA for significant overlapping contingencies (N-1-1 and N-2) as requested in the Third BTA.
- f. Arizona transmission providers are doing an effective job of assuring that Arizona has an adequate and reliable access to merchant plants at Palo Verde. In the near term, with the additions of the Palo Verde-TS5 and Hassayampa-Pinal West-Santa Rosa projects the outlet capability of the Palo Verde Hub to Arizona will be significantly increased. Currently, under conditions when the Arizona market or markets east of Palo Verde are not sufficiently robust, some portion of the 10,240 MW capacity of Palo Verde Hub merchant generation may be stranded at the Hub due to transmission limitations into California when the market would otherwise desire access. The short-term upgrades on Path 49 and the two 500kV transmission projects planned to the west of Palo Verde will help remedy such market limitations between Arizona, California, and Nevada.
6. There is very little additional long-term firm transmission capacity available to export or import energy over Arizona's transmission system. Studies investigating transmission additions required between Arizona

Deleted: However, APS has initiated a solicitation for 100 MW of new generation resources in the Yuma area and the economics of this proposal should be submitted to Staff for review.

Deleted: The existing and near term planned Palo Verde transmission system fails to accommodate the full output of all new power plants interconnecting at the Palo Verde Hub except under an idealistic market delivery assumption. The Fourth BTA concludes that after addition of two planned 500 kV projects (Hassayampa-Pinal West-Santa Rosa 500kV in 2008 and Palo Verde-TS5 in 2009) that will significantly increase the outlet capability of the Palo Verde hub and eliminate load shedding requirements for a common corridor outage of 500kV lines leaving the Palo Verde Hub. [Subject to confirmation]



and California and between New Mexico and Arizona continue to explore the scope, participation and timing of alternative projects.

7. The 2006-2015 expansion plan includes a proposal for certain economically driven regional projects that may both provide economic benefits to Arizona consumers and increase transmission system capability beyond a level required just to maintain reliability. Commission Staff welcomes such proposals and encourages parties to pursue projects that provide economic benefits to Arizona consumers. APS has initiated regional stakeholder discussions for a conceptual TransWest Express 500kV Project that could significantly increase import capability into Arizona from future coal and wind resources in Wyoming.
8. Some new power plants have interconnected to Arizona's bulk transmission system via a single transmission line or tie rather than continuing Arizona's best engineering practices of multiple lines emanating from power plants. As interconnection of new transmission lines are considered for the Palo Verde Hub, they should be encouraged to terminate at these new power plant switchyards in order to mitigate this regional reliability concern.
9. Certain N-1 contingency violations occurring in the SWTC 2015 planning study and certain N-2 and extreme contingency results in TEP's 2016 case still need to be resolved. These issues occur at or beyond the end year of the current 10-year plan and there is still sufficient time to satisfactorily resolve these concerns.
10. The Commission Staff concludes that the direction of collaborative planning processes by transmission providers and stakeholders in Arizona is consistent with the spirit of the requirements for transmission planning described in EPAct-05 and FERC Order 888. This is reinforced by the recent decision of the WECC to form a Transmission Expansion Planning Policy Committee to provide a transparent West-wide stakeholder process for related data and studies.

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Appendix A: Guiding principles for ACC staff determination of electric system adequacy and reliability

This document serves the dual purpose of providing the guiding principles for ACC Staff determination of electric system adequacy and reliability in the two areas of transmission and generation.

Transmission

A.R.S §40-360.02E obligates the Arizona Corporation Commission (ACC) to biennially make a determination of the adequacy and reliability of existing and planned transmission facilities in the state of Arizona. Current state statutes and ACC rules do not establish the basis upon which such a determination is to be made. Therefore, ACC Staff will use the following guiding principles to make the required adequacy and reliability determination until otherwise directed by state statutes or ACC rules.

1. Transmission facilities will be evaluated using Western Electricity Coordinating Council (WECC), or its successor's, Reliability Criteria for System Planning and Minimum Operating Reliability Criteria.
2. Transmission planning and operating practices traditionally utilized by Arizona electric utilities will apply when more restrictive than WECC criteria.
3. Compliance with A.C.C. R14-2-1609.B¹ will be established by analysis of power flow and transient stability simulation of single contingency outages (N-1) of generating units, EHV and local transmission lines of greater than 100 kV nominal system voltage, and associated transformers. Reliance on remedial action such as generator unit tripping or load shedding for single contingency outages will not be considered an acceptable means of compliance with this rule.

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Generation

Pursuant to A.R.S. §40-360.07, the ACC must balance, in the broad public interest, the need for adequate, economical, and reliable supply of electric power with the desire to minimize the effect on the environment and ecology of the state when considering the siting of a power plant or transmission line. The laws of physics dictate that generation and transmission facilities are

¹ R14-2-1609.B refers to the obligation of Utility Distribution Companies to assure that adequate transmission import capability and distribution system capacity are available to meet the load requirements of all distribution customers within their service area.

**Appendix B: 2006 BTA Workshop I and II list attendees****Workshop I – June 6, 2006**

	Name		Representing	Phone Number	E-Mail Address
1	Jerry D.	Smith	ACC	(602) 542-7271	jsmith@cc.state.az.us
2	Ken	Bagley	Genesee	(480) 367-4282	kbagley@cox.net
3	Prem	Bahl	ACC	(602) 542-7269	pbahl@cc.state.az.us
4	Ed	Beck	TEP	(520) 745-3276	ebeck@tep.com
5	Steven C.	Begay	Dine Power Authority		dpasteve@citlink.net
6	Patrick	Black	Fennemore Craig		pblack@felaw.com
7	Jane	Brandt	SRP		jbrandt@srpnet.com
8	Ian	Calkins	Copper State Consulting Group		ian@copperstate.net
9	Jim	Charters	Retired	(623) 572-7972	j_charters@msn.com
10	Brian	Cole	APS		Brian.Cole@APS.com
11	David	Couture	TEP		dcouture@TEP.com
12	Michael	Curtis	Mohave Electric	(602) 248-0392	mcurtis401@aol.com
13	Cary	Deise	APS	(602) 250-1232	cary.deise@aps.com
14	Chris Clark	DeSchene	Dine Power Authority		clarkdeschene@att.net
15	Mark	Etherton	SWAT/AZNM	(602) 809-0707	mle@krsaline.com
16	Bruce	Evans	SWTC	(520) 586-5336	bevans@swtransco.coop
17	Linda	Fisher	Corp. Commission - Legal		Lfisher@AZCC.gov
18	Commissioner	Gleason			
19	Charles	Hains	Corp. Commission - Legal		Chaines@AZCC.gov
20	Thomas A.	Hine	Mohave Electric		thineesq@yahoo.com
21	Chairman	Hutch-Miller			
22	Joshua	Johnston	Western Area Power Admin.		jjohnston@wapa.gov
23	Robert	Kondozioka	SRP	(602) 236-0971	rekondzi@srpnet.com
24	David M.	Korinek	KEMA		David.Korinek@KEMA.com
25	Peter	Krzykos	APS		Peter.Krzykos@APS.com
26	Steven	Mavis	SCE	(626) 302-8175	steven.mavis@sce.com
27	Jeff	Palermo	KEMA	(703) 631-6912	jpalermo@kema.com
28	Greg	Patterson	AZCPA		greg@azcpa.org
29	Milt	Percival	WSES for 3M	(602) 352-2794	mperc7439@aol.com
30	Harlow	Peterson	USE Consulting		harlowpeterson@useconsulting.com
31	Karilee	Ramaley	APS		KSR@pinnaclevest.com
32	Gary T.	Romero	SRP	(602) 236-0974	gtrmero@srpnet.com



	Name		Representing	Phone Number	E-Mail Address
33	Chuck	Russell	SRP		csrusse@srpnet.com
34	Gordon	Samuel	APS		gordon.samueljr@aps.com
35	Bob	Smith	APS	(602) 250-1144	robert.smith@aps.com
36	Jason	Spitzkoff	APS		Jason.Spitzkoff@APS.com
37	LeeAnn	Torkelson	SWAT(CATS) HV		LVT@krsaline.com
38	Rebecca	Turner	Gila River Power, L.P		Rturner@entegrapower.com
39	Jennie	Vega	APS		Jennie.Vega@APS.com
40	Scott	Wakefield	RUCO		swakefield@azruco.gov
41	Ray	Williamson	AZ Corp. Comm.	(602) 542-0828	rwilliamson@cc.state.az.us
42	Laurie	Woodal	AZ Atty. General		Laurie.Woodall@azag.gov
43	Leonard	York	Western Area Power Admin.		York@wapa.gov

Workshop II – September 8, 2006



Plant name	Switchyard voltage (kV)	No. units	Primary energy source	Summer capacity (MW)	AZ capacity (MW)	AZ capacity share (%)	2005 annual net generation (MWh)
Arizona Consolidated Steamake		1	SUB	27.2	0	0%	411,664
		1	SUB	43.3	0	0%	
Agua Fria		1	NG	113	113	100%	141,617
		1	NG	113	113	100%	
		1	NG	181	181	100%	
		1	NG	73	73	100%	
		1	NG	73	73	100%	
		1	NG	73	73	100%	
		1	SUN	0.2	0.2	100%	
Apache Station		1	NG	10.2	10.2	100%	2,876,049
		1	NG	18.5	18.5	100%	
		1	NG	60	60	100%	
		1	NG	40	40	100%	
		1	NG	72	72	100%	
		1	SUB	175	175	100%	
		1	SUB	175	175	100%	
Arlington Valley Energy Facility		1	NG	165	165	0%	1,336,932
		1	NG	165	165	0%	
		1	NG	250	250	0%	
Biosphere 2 Center		1	DFO	1.5	0	0%	n/a
		1	NG	1.6	0	0%	
Cajon		1	WAT	1.4	1.4	100%	n/a
		1	WAT	1.4	1.4	100%	
		1	WAT	1.4	1.4	100%	
Cholla		1	SUB	110	68.0	61.81%	7,577,568
		1	SUB	260	260.0	100%	
		1	SUB	260	160.7	61.81%	
		1	SUB	380	234.9	61.81%	
Cogeneration 1		1	NG	8.3	0	0%	n/a
Coronado		1	SUB	395	395	100%	6,070,915
		1	SUB	390	390	100%	
Davis Dam		1	WAT	51.7	51.7	100%	992,230
		1	WAT	51.7	51.7	100%	
		1	WAT	48	48	100%	
		1	WAT	51.7	51.7	100%	
		1	WAT	51.7	51.7	100%	
Demoss Petrie		1	NG	72.2	72.2	100%	18,762
Desert Basin		1	NG	161	161	100%	2,446,371

Comment: I say we would have a similar situation. I say that because there is a commission on the name of the lake, and I say completely.

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Plant name	Switchyard voltage (kV)	No. units	Primary energy source	Summer capacity (MW)	AZ capacity (MW)	AZ capacity share (%)	2005 annual net generation (MWh)
Abraham Consolidated Snowflake		1	SUB	27.2	0	0%	411,664
		1	SUB	43.3	0	0%	
		1	NG	161	161	100%	
		1	NG	253	253	100%	
Douglas		1	DFO	15	15	100%	n/a
Gila River Power Station		1	NG	146	0	0%	4,546,967
		1	NG	146	0	0%	
		1	NG	146	0	0%	
		1	NG	146	0	0%	
		1	NG	146	0	0%	
		1	NG	146	0	0%	
		1	NG	146	0	0%	
		1	NG	146	0	0%	
		1	NG	223	0	0%	
		1	NG	223	0	0%	
		1	NG	223	0	0%	
Glen Canyon Dam		1	WAT	165	0	100%	3,299,429
		1	WAT	157	0	100%	
		1	WAT	165	0	100%	
		1	WAT	157	0	100%	
		1	WAT	165	0	100%	
		1	WAT	165	0	100%	
		1	WAT	157	0	100%	
Harquahala		1	NG	206.4	0	0%	461,267
		1	NG	200	0	0%	
		1	NG	200	0	0%	
		1	NG	148.8	0	0%	
		1	NG	148.8	0	0%	
		1	NG	137.6	0	0%	
Headgate Rock		1	WAT	6.5	6.5	100%	n/a
		1	WAT	6.5	6.5	100%	
		1	WAT	6.5	6.5	100%	
Hoover Dam		1	WAT	2.7	2.7	100%	1,879,235
		1	WAT	130	130	100%	
		1	WAT	130	130	100%	
		1	WAT	130	130	100%	
		1	WAT	130	130	100%	
		1	WAT	127	127	100%	
		1	WAT	130	130	100%	

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this plant.



Plant name	Switchyard voltage (kV)	No. units	Primary energy source	Summer capacity (MW)	AZ capacity (MW)	AZ capacity share (%)	2005 annual net generation (MWh)
Apache Consolidated Snowflake		1	SUB	27.2	0	0%	411,664
		1	SUB	43.3	0	0%	
		1	WAT	130	130	100%	
		1	WAT	61.5	61.5	100%	
		1	WAT	68.5	68.5	100%	
Horse Mesa		1	WAT	10	10	100%	63,065
		1	WAT	10	10	100%	
		1	WAT	10	10	100%	
		1	WAT	119	119	100%	
Irving		1	WAT	1.4	1.4	100%	n/a
Kyrene		1	NG	34	34	100%	828,589
		1	NG	72	72	100%	
		1	NG	59	59	100%	
		1	NG	53	53	100%	
		1	NG	53	53	100%	
		1	NG	144	144	100%	
		1	NG	107	107	100%	
Mesquite Generating Station		1	NG	146.2	0	0%	6,724,135
		1	NG	144.5	0	0%	
		1	NG	146.2	0	0%	
		1	NG	146.2	0	0%	
		1	NG	245.1	0	0%	
		1	NG	245.1	0	0%	
Mormon Flat		1	WAT	11	11	100%	27,229
		1	WAT	57	57	100%	
Navajo		1	BIT	750	506.2	67.49%	17,030,674
		1	BIT	750	506.2	67.49%	
		1	BIT	750	506.2	67.49%	
North Loop		1	NG	25	25	100%	n/a
		1	NG	25	25	100%	
		1	NG	23	23	100%	
		1	NG	23	23	100%	
Ocotillo		1	NG	110	110	100%	145,500
		1	NG	110	110	100%	
		1	NG	50	50	100%	
		1	NG	50	50	100%	
		1	SUN	0.1	0.1	100%	
		1	SUN	0.1	0.1	100%	
		1	SUN	0.4	0.4	100%	
Palo Verde		1	NUC	1243	775.5	62.39%	25,807,446

Comment 35: 1/2 kWh is at the top of the table. Needs to be fixed.

Comment 35: 1/2 kWh is at the top of the table. Needs to be fixed.



Comment [156] has a footnote that is overable. Needs to be fixed.
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Plant name	Switchyard voltage (kV)	No. units	Primary energy source	Summer capacity (MW)	AZ capacity (MW)	AZ capacity share (%)	2005 annual net generation (mwh)
Abraham Consolidated Steward		1	SUB	27.2	0	0%	411,664
		1	SUB	43.3	0	0%	
		1	SUN	5.1	5.1	100%	
Stewart Mountain		1	WAT	13	13	100%	n/a
Sundt		1	SUB	156	156	100%	1,152,849
		1	NG	24	24	100%	
		1	NG	25	25	100%	
		1	NG	81	81	100%	
		1	NG	81	81	100%	
		1	NG	105	105	100%	
Tri Cities		1	LFG	0.8	0.8	100%	n/a
		1	LFG	0.8	0.8	100%	
		1	LFG	0.8	0.8	100%	
		1	LFG	0.8	0.8	100%	
		1	LFG	0.8	0.8	100%	
Valencia		1	NG	14.7	14.7	100%	n/a
		1	NG	14.7	14.7	100%	
		1	NG	14.7	14.7	100%	
Waddell		1	WAT	10	10	100%	n/a
		1	WAT	10	10	100%	
		1	WAT	10	10	100%	
		1	WAT	10	10	100%	
West Phoenix		1	NG	80	80	100%	2,299,621
		1	NG	80	80	100%	
		1	NG	80	80	100%	
		1	NG	71	71	100%	
		1	NG	36	36	100%	
		1	NG	172	172	100%	
		1	NG	172	172	100%	
		1	NG	186	186	100%	
		1	NG	50	50	100%	
		1	NG	50	50	100%	
Yucca		1	NG	18	18	100%	245,392
		1	NG	18	18	100%	
		1	DFO	20	0.0	0%	
		1	NG	52	52	100%	
		1	DFO	51	51	100%	
		1	NG	75	42.5	56.65%	
Yuma Axis		1	DFO	22	22	100%	n/a
Yuma Cogeneration		1	NG	35.14	0	0%	n/a

Comment 153: Abrahm is not
part of this table. Need to be
fixed.

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Plant name	Switchyard voltage (kV)	No. units	Primary energy source	Summer capacity (MW)	AZ capacity (MW)	AZ capacity share (%)	2005 annual net generation (MWh)
Adrian Consolidated		1	SUB	27.2	0	0%	411,664
Snowflake		1	SUB	43.3	0	0%	
Associates		1	NG	17.12	0	0%	
46 Plants Total		192		24,248	13,539.7	70.6%	100,270,606
Source: U.S. Department of Energy, Energy Information Administration, Form EIA-860, Form EIA-906, Form EIA-920.							
Primary energy sources:							
BIT Anthracite Coal, Bituminous Coal							
DFO Distillate Fuel Oil (includes all Diesel and No. 1, No. 2, and No. 4 Fuel Oils)							
LFG Landfill Gas							
NG Natural Gas							
NUC Nuclear (Uranium, Plutonium, Thorium)							
SUB Subbituminous Coal							
SUN Solar (Photovoltaic, Thermal)							
WAT Water (Conventional, Pumped Storage)							

Comment [D53]: Abbreviations at the top of every table needs to be fixed.

Comment [J58]: Needs to be updated to account for the corrections.



Appendix D: Information Resources

Transmission Planning Studies and related documents used to develop this Third BIA report were assembled from the following reports, presentations, and dockets:

Utilities' 2004 Ten-Year Transmission Plans

1. Arizona Public Service Company (APS)
2. Salt River Project (SRP)
3. Southwest Transmission Cooperative (SWTC)
4. Southwestern Power Group, Inc. (SWPG)
 - a. Iditar
 - b. Powar
5. Southern California Edison (SCE)
6. Texas-New Mexico Power Company (TNMP)
7. Tucson Electric Power Company (TEP)
8. UniSource Electric (UNSE)

Comment (159): It appears that this section has not been updated from the 2004 BIA.

Generation Interconnection Studies and Related FERC Interconnection Standards and Compliance Documents

9. FERC Order 2003 and 2003-A, Standard Interconnection Agreements & Procedures for Large Generators
10. Arizona Utilities Compliance Documents regarding the FERC Order 2003 and 2003-A

Arizona Corporate Commission Documents

11. ACC Docket No. E-0000A-02-0051, Decision 65743, Track B

Reliability Must Run Workshop

12. ACC 2004 RMR Workshop Presentations and Reports
13. FERC Related orders (PL04-2 policy related to bid based market)

**Transmission Projects Reports**

- 14. Central Arizona Transmission System ("CATS") Phase 3 Report¹
- 15. Southwest Transmission Expansion Plan ("STEP") 2003 Final Report²

Regional Committees and Working Groups Materials

- 16. Southwest Area Transmission ("SWAT") subcommittee organization and study plans³
- 17. Seam Steering Group – Western Interconnection ("SSG-WI") Planning Work Group 2003 Transmission Report⁴

North America Electric Reliability Council ("NERC") Assessments Studies and Reliability Standards Related Materials

- 18. NERC Reliability Standards⁵
- 19. 2004 SUMMER ASSESSMENT Reliability of the Bulk Electricity Supply in North America⁶
- 20. Reliability Readiness Audit Reports for the relevant Control Areas

Western Systems Coordinating Council ("WSCC") Standards and Studies**Arizona Transmission Providers Reliability Standards****First and Second BTA Reports**

¹ <http://www.azpower.org/cats/>

² <http://www.aiso.com/docs/2004/03/08/2004030814004810105.doc>

³ <http://www.azpower.org/swat/>

⁴ http://www.ssgwi.com/documents/316-FERC_Filing__103103__FINAL_TransmissionReport.pdf

⁵ <http://www.nerc.com/standards/>

⁶ ftp://www.nerc.com/pub/sys/all_updl/docs/pubs/summer2004.pdf



Status	Project	Justification	CEC needed
Construction start 2008	Raceway-Avery 230kV line	This line will serve projected need for electric energy in the area immediately north of the Phoenix Metropolitan area. Additionally, improved reliability and continuity of service will result for the area's growing communities such as Anthem, Desert Hills and New River. The first circuit is scheduled to be in-service for the summer of 2009 and the inservice date for the second circuit will be evaluated in future planning studies by SRP as part of their planned Westwing-Pinnacle Peak 230kV project.	Certificate of Environmental Compatibility issued 6/18/03 (Case No. 120, Decision No. 64473, North Valley Project).
Construction start 2008	Rancho Vistoso Substation to future Catalina Substation 138 kV	To provide additional electric service to the south-central part of Tucson Electric Power Company's service area.	Under Review
Construction start 2008	Valencia to San Joaquin 115 kV Line	Provide for increased transfer capability and voltage support in Southern Pima County and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.	Yes
2010 completion			
Construction start 2004	Pinnacle Peak-TS6-Avery 230kV line	This project will serve projected need for electric energy in the area immediately north of the Phoenix Metropolitan area. Additionally, improved reliability and continuity of service will result for the growing communities in the areas of Anthem, Desert Hills, New River, and north Phoenix. The first circuit is scheduled to be in-service for the summer of 2010 and the in-service date for the second circuit will be evaluated in future planning studies by SRP as part of their planned Westwing-Pinnacle Peak 230kV project.	Certificate of Environmental Compatibility issued 6/18/03 (Case No. 120, Decision No. 64473, North Valley Project).
Construction start 2008	Palm Valley-TS2-TS1 230kV line	This project is required to serve the increasing need for electric energy in the western Phoenix Metropolitan area, providing more capability to import power into the Phoenix Metropolitan area along with improved reliability and continuity of service for growing communities such as El Mirage, Surprise, Youngtown, and Buckeye. The first circuit is scheduled to be in-service for the summer of 2010 and the in-service date for the second circuit will be evaluated in future planning studies.	The Palm Valley-TS2 230kV line portion was sited as part of the West Valley South 230kV Transmission Line project and a Certificate of Environmental Compatibility was issued 12/24/03 (Case No. 122, Decision No. 66646). The TS1-TS2 230kV line portion was sited as part of the West Valley North 230kV Transmission Line project and a Certificate of Environmental Compatibility was issued 5/5/05 (Case No. 127, Decision No. 67828).

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Status	Project	Justification	CEC needed
Construction start 2009	Raceway 500kV to 230kV substation 230kV line	The Raceway 500kV substation will be located north of the existing Raceway 230kV substation due to physical/geographic constraints. The 500/230kV transformers will be located at the Raceway 500kV substation, therefore 230kV lines are needed between the 500/230kV transformers and the Raceway 230kV substation.	An application for a Certificate of Environmental Compatibility has not yet been filed. It is anticipated that this project will be filed with the Raceway-Pinnacle Peak 500kV Transmission project.
Construction start 2010	Vail - Wentworth 138 kV - two circuits	Required to serve load at the new Wentworth 138/13.8 kV Substation locate approximately 7.5 miles due east of the Vail Substation Circuit 1: utilize conductor that was installed in the past but left de-energized, install - 3.0 miles of new conductor east from Vail on existing structures to make connection to this existing conductor Circuit 2: tap the existing Vail-Fort Huachuca or Vail- Spanish Trail line	Yes
2011 completion			
Construction start 2008	Western Parker-Davis 115 kV Upgrades to 230 kV (Reference Western Ten-Year Plan 2003 filing)	Expected to deliver lower cost energy via additional capacity over the upgraded 230 kV System, and to provide redundancy to bulk receiving stations.	No. Western will upgrade existing 115 kV facilities to 230 kV.
Construction start 2010	Jojoba loop-in of TS4-Panda 230kV line	This substation will be needed to serve projected need for electric energy for the growing communities in the areas of Buckeye, Goodyear, and Gila Bend.	Certificate of Environmental Compatibility issued 10/16/00 (Case No. 102, Decision No. 62960, Gila River Transmission Project).
Construction start 2010	Loop existing Irvington Station to Vail Substation #2 line through future University of Arizona Tech Park Substation.	To provide additional electric service to the south-central part of Tucson Electric Power Company's service area.	Yes
Construction start 2011	Thornysdale to CAP Twin Peaks 115 kV Line	Provide for increased transfer capability and voltage support in Southern Pima County and to provide for anticipated load growth in the certificated service area of Trico Electric Cooperative, Inc.	Yes
2012 completion			
Construction start 2009	Upgrade existing 115kV transmission line to Nogales	The upgrade of the transmission line increases transmission system reliability and provides additional load serving capacity to UNS Electric Santa Cruz Service Area.	

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Status	Project	Justification	CEC needed
construction started 1985 Phase 1 - 1994 (Completed) Phase 2 - 2000 (Completed)	Irvington Substation to East Loop Substation (through 22nd Street Substation).	To provide additional electric service to the central area of Tucson Electric Power Company's service area and to reinforce the local transmission system.	Siting Case #66
Construction started 1985 Phase 1 - 1987 (Completed)	East Loop Substation to Northeast Substation (through Snyder Substation)	To provide additional electric service to the northeastern area of Tucson Electric Power Company's service area.	Siting Case #47
Construction started 1976 Phase 1 - 1977 (Completed) Phase 2 - 1983 (Completed)	Vail Substation to East Loop Substation (through Houghton Loop Switching Station*, Spanish Trail and Roberts Substations).	To provide additional electric service to the eastern portion of Tucson Electric Power Company's service area and to reinforce the local transmission system.	Siting Case #8
TBD	Santa Rosa-Pinal South 230kV line	This line will serve increasing loads in Pinal County and will improve reliability and continuity of service for the rapidly growing communities.	Authority for the 230kV line strung on the 500kV structures was granted in the Certificate of Environmental Compatibility issued in 2005, Case No. 126, Decision Nos. 68093 and 68291.
TBD	Westwing-El Sol 230kV line	This line will increase system capacity to serve growing demand for electric energy in the Phoenix Metropolitan area, while maintaining system reliability and integrity for delivery of bulk power from Westwing south into the APS Phoenix Metropolitan area 230kV transmission system.	Certificate of Environmental Compatibility issued 7/26/73 (Case No. 9, docket No. U-1345). Note that this Certificate authorizes two double-circuit lines. Construction of the first double circuit line was completed in March 1975. Construction of the second line, planned to be built with double-circuit capability but initially operated with a single circuit, is described above.
TBD	Westwing-Raceway 230kV line	This line will serve increasing loads in the far north and northwest parts of the Phoenix Metropolitan area and provide contingency support for multiple Westwing 500/230kV transformer outages. The in-service date for the first circuit will continue to be evaluated in future planning studies by APS and the in-service date for the second circuit will be evaluated in future planning studies by SRP as part of their planned Westwing-Pinnacle Peak 230kV project.	Certificate of Environmental Compatibility issued 6/18/03 (Case No. 120, Decision No. 64473, North Valley 230kV Transmission Line Project).
TBD	Yucca-TS8 230kV line	This project would serve the increasing need for electric energy in the city of Yuma. Additionally, improved reliability and continuity of service will result for the fast growing Yuma County.	An application for a Certificate of Environmental Compatibility has not yet been filed.

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